Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025

Second Semester

Electronics and Communication Engineering

BE3254 / UBET24204 - Electrical and Instrumentation Engineering)

Regulations – 2021 & 2024

Duration : 3 Hrs *Maximum : 100 Marks*

*PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	Define voltage regulation of a transformer.	L1	1	2
2.	Calculate the efficiency of a transformer with a power input of 500 kW and losses of 20 kW.	L3	1	2
3.	Recall the role of field winding in a motor.	L1	2	2
4.	Distinguish between series and shunt motor?	L2	2	2
5.	Define slip in an induction motor.	L1	3	2
6.	Summarize the common methods used for starting synchronous motors.	L2	3	2
7.	Differentiate between moving coil and moving iron meters.	L2	4	2
8.	What are the key components of a data acquisition system?	L2	4	2
9.	Draw the typical power supply structure scheme.	L1	5	2
10.	Justify the significance of earthing in electrical systems?	L2	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)*

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a	i	A transformer with a turns ratio of 8:1 has a primary voltage of 230V. Calculate the secondary voltage and current when connected to a load of 20Ω.	L3	1	8
		ii	Explain the construction and operation of a three-phase transformer with detailed diagrams.	L2	1	8
			Or			
	b	i	Draw and explain the phasor diagram of a transformer under load conditions.	L3	1	8
		ii	Calculate the voltage regulation for a transformer with a no-load voltage of 500V and a full-load voltage of 470V.	L3	1	8
12.	a	i	Derive the EMF equation for a DC generator.	L2	2	8
		ii	Describe the working principle of a stepper motor and explain how it differs from a traditional DC motor.	L2	2	8
			Or			
	b		Discuss the various starting methods of DC motors highlighting the use of a starter in detail.	L2	2	16

13.	a	i	Explain the principle and working of squirrel-cage induction motors.	L2	3	8
		ii	Derive the EMF equation of an alternator.	L2	3	8
			Or			
	b	i	Derive the torque equation of a synchronous motor and explain the factors affecting the torque.	L2	3	8
		ii	Compare and contrast the construction and operation of three-phase and single-phase induction motors.	L2	3	8
14.	a		Explain how three-phase power is measured using two-wattmeter and three-wattmeter methods.	L2	4	16
			Or			
	b	i	Explain the functional elements of an instrument and how they affect the accuracy and reliability of measurements.	L2	4	8
		ii	Discuss the role and functioning of a Data Acquisition System (DAQ) in modern measurement systems.	L2	4	8
15.	a	i	Discuss the operation and applications of a Miniature Circuit Breaker (MCB).	L2	5	8
		ii	Describe the function of Earth Leakage Circuit Breakers (ELCB) and their importance in electrical safety.	L2	5	8
			Or			
	b	i	Describe the methods of earthing and their applications in power systems.	L2	5	8
		ii	Elaborate on the advantages of using Moulded Case Circuit Breakers (MCCB) over fuses.	L2	5	8